

IN THE CLAIMS:

Claims 1, 2 and 4 through 18 are currently pending in this application. Claims 5 through 16 have been previously withdrawn from consideration. Please cancel Claim 3 without prejudice or disclaimer, please amend Claims 1, 2 and 4 through 12, and please add new Claims 17 and 18, as follows:

1. (Currently Amended) A process for producing a semiconductor device, comprising:
 - a step of forming a gate insulator on a silicon substrate; and
 - a step of forming a gate electrode, a source electrode and a drain electrode on the silicon substrate,
 - wherein said step of forming the gate insulator includes
 - a first step of forming a silicon nitride film on the surface of the silicon substrate by irradiating to the silicon substrate nitrogen radicals generated from a radical nitriding apparatus, the radical nitriding apparatus being provided with a plasma chamber for generating nitrogen plasma including the nitrogen radicals, a substrate susceptor, provided outside of the plasma chamber, for supporting the silicon substrate, and ion deflecting means provided between the plasma chamber and the substrate susceptor, and wherein,
 - in said step of forming a silicon nitride film, more atomic nitrogen radicals are generated than N₂ radicals in the plasma chamber.
2. (Currently Amended) A process for producing a semiconductor device, comprising:
 - a step of forming a gate insulator on a silicon substrate; and
 - a step of forming a gate electrode, a source electrode and a drain electrode on the silicon substrate,
 - wherein said step of forming the gate insulator includes
 - a first step of forming a silicon nitride film on the surface of the silicon substrate by irradiating to the silicon substrate nitrogen radicals generated from a radical nitriding apparatus, the radical nitriding apparatus being provided with a plasma chamber for generating nitrogen plasma including the nitrogen radicals, a substrate susceptor, provided outside of the plasma chamber, for supporting the silicon substrate, and ion deflecting means provided between the plasma chamber and the substrate susceptor

~~The process according to claim 1,~~ wherein said ion deflecting means are ion deflecting electrodes.

3. (Cancelled)
4. (Currently Amended) The process according to claim 2, wherein, in said step of forming a silicon nitride film, more atomic nitrogen radicals are generated than N_2 radicals in the plasma chamber.
5. (Currently Amended) The process according to claim 1, wherein said step of forming a gate insulator on a silicon substrate further includes a step of forming a silicon ~~oxinitride~~ oxi-nitride film, by oxidizing said silicon nitride film after said step of forming a silicon nitride film.
6. (Currently Amended) The process according to claim 2, wherein said step of forming the gate insulator on a silicon substrate further includes a step of forming a silicon ~~oxinitride~~ oxi-nitride film, by oxidizing the silicon nitride film after said step of forming a silicon nitride film.
7. (Currently Amended) The process according to claim 3, wherein said step of forming the gate insulator on a silicon substrate further includes a step of forming a silicon ~~oxinitride~~ oxi-nitride film, by oxidizing the silicon nitride film after said step of forming a silicon nitride film.
8. (Currently Amended) The process according to claim 4, wherein said step of forming the gate insulator on a silicon substrate further includes a step of forming a silicon ~~oxinitride~~ oxi-nitride film, by oxidizing the silicon nitride film after said step of forming a silicon nitride film.
9. (Currently Amended) The process according to claim 1, wherein said step of forming the gate insulator on a silicon substrate further includes a second step of forming a metal film on the silicon nitride film, and a step of forming a silicon ~~oxinitride~~ oxi-nitride film and a metal oxide film by oxidizing the silicon nitride film and the metal film, after said step of forming a silicon nitride film.
10. (Currently Amended) The process according to claim 2, wherein said step of forming the gate insulator on a silicon substrate further includes a second step of forming a

metal film on the silicon nitride film, and a step of forming a silicon ~~oxinitride~~ oxi-nitride film and a metal oxide film by oxidizing the silicon nitride film and the metal film, after said step of forming a silicon nitride film.

11. (Currently Amended) The process according to claim 3, wherein said step of forming the gate insulator on a silicon substrate further includes a second step of forming a metal film on the silicon nitride film, and a step of forming a silicon ~~oxinitride~~ oxi-nitride film and a metal oxide film by oxidizing the silicon nitride film and the metal film, after said step of forming a silicon nitride film.
12. (Currently Amended) The process according to claim 4, wherein said step of forming the gate insulator on a silicon substrate further includes a second step of forming a metal film on the silicon nitride film, and a step of forming a silicon ~~oxinitride~~ oxi-nitride film and a metal oxide film by oxidizing the silicon nitride film and the metal film, after said step of forming a silicon nitride film.
13. (Withdrawn) The process according to claim 1, wherein said step of forming the gate insulator on a silicon substrate further includes a step of forming a ferroelectric film on the silicon nitride film after said step of forming a silicon nitride film.
14. (Withdrawn) The process according to claim 2, wherein said step of forming the gate insulator on a silicon substrate further includes a step of forming a ferroelectric film on the silicon nitride film after said step of forming a silicon nitride film.
15. (Withdrawn) The process according to claim 3, wherein said step of forming the gate insulator on a silicon substrate further includes a step of forming a ferroelectric film on the silicon nitride film after said step of forming a silicon nitride film.
16. (Withdrawn) The process according to claim 4, wherein said step of forming the gate insulator on a silicon substrate further includes a step of forming a ferroelectric film on the silicon nitride film after said step of forming a silicon nitride film.

17. (New) The process according to claim 1,
wherein the radical nitriding apparatus is further provided with a Radio Frequency (RF) induction coil installed surrounding the plasma chamber, and
wherein, in said step of forming a silicon nitride film, Radio Frequency (RF) is applied from an outside power source to the Radio Frequency (RF) induction coil.
18. (New) A process according to claim 17,
wherein the radical nitriding apparatus is further provided with a vacuum vessel communicating with one side of the plasma chamber via openings,
wherein the substrate susceptor is installed in the vacuum vessel,
wherein, in said step of forming a silicon nitride film, nitrogen radicals are introduced into the vacuum vessel by a pressure difference between the plasma chamber and the vacuum vessel, and
wherein, in said step of forming a silicon nitride film, ions leaked from the plasma chamber are deflected and restrained from reaching the silicon substrate by the ion deflecting means.